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Associations between authoritative parenting and the sun exposure and sun protective behaviours of adolescents and their friends

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Abstract

Associations between the sun exposure and sun protective behaviours of adolescents and their friends were examined along with the role played by authoritative parenting and other family and peer socialization factors. Four hundred and two adolescents (198 males, 204 females) participated in the research. It was found that these adolescents and their friends shared similar sun exposure and sun protective behaviours and had similar parenting backgrounds. Parental authoritativeness was positively associated with the use of sun protection, even after the effects of other familial and peer variables were controlled, but not with the time spent sunbathing which was associated with friends' behaviours. The theoretical and practical implications of these findings are discussed.

Keywords: adolescence; authoritative parenting; peer influence; sun exposure; sun protection

Authoritative parenting and the sun exposure and sun protective behaviours of adolescents and their friends

It is well established that excessive exposure to the sun can be a health risk, especially for young people. Exposure to ultraviolet radiation (UVR) and sunburn, particularly during childhood and adolescence, has been shown to increase the risk of skin cancer later in life (Cancer Research UK, 2009; Elwood & Jopson, 1997). The last decade has seen a substantial increase in rates of skin cancer. In the UK, the incidence rates for malignant melanoma, the most serious form of skin cancer, have more than quadrupled since the 1970s, and in 2006 more than 10,400 cases were diagnosed (Cancer Research UK, 2009). Skin cancer becomes more common with increasing age but young people are also at risk. Malignant melanoma is now the most common cancer in young adults (aged 15-34) in the UK (Cancer Research UK, 2009). Melanoma is unusual amongst cancers in that it is almost entirely preventable. Jorgensen (2002) argues that appropriate use of sun protection strategies could reduce the lifetime risk for skin cancer by over 75 per cent. It is particularly crucial to protect skin during childhood and adolescence but, despite public education campaigns (see Buller & Borland, 1999; Lowe, Balanda, Stanton & Gillespie, 1999), it appears that significant numbers of young people continue to expose themselves to the sun to a risky extent (Horsley, Charlton & Waterman, 2002; Stanton, Janda, Baade, & Anderson, 2004).

In contrast with other health-risk behaviours of young people such as smoking (see Brook, Ning & Brook, 2006; Wilkinson & Abraham, 2004), drinking alcohol (see Callas, Flynn & Worden, 2004) and illegal drug use (see Brook et al, 2001), there has been less research into the factors underlying risky behaviour in respect of sun exposure. For the other health risk behaviours listed here, there is a well-established set of factors that are known to be correlated with riskier behaviour among adolescents. They include demographic factors such as parents' income, education and occupation, and the young person's own age and gender. They also include personality factors (e.g., for drug use and smoking see Brook et al.,

2001; Brook et al., 2006) and socialisation factors such as parents' own behaviour and attitudes in the corresponding area, parenting style and the behaviour of the young person's friends (e.g. for smoking, see Mewse, Eiser, Slater & Lea, 2004).

Evidence on the correlates of risky behaviour with regard to sun exposure is more limited, but suggests that it is correlated with many of the same psychosocial and demographic factors as other adolescent health-risk behaviours including age, gender, knowledge and attitudes (e.g., Arthey & Clarke, 1996; Cokkinides et al., 2001, 2006; Keeney, McKenna, Fleming, & McIlfatrick, 2009; Stanton, Janda, Baade, & Anderson, 2004). These associations are not always straightforward. Evidence of gender differences in sun protective behaviours and attitudes is ambiguous with some studies finding gender effects (e.g., Broadstock, Borland & Hill, 1996; Stanton et al., 2004) while others do not (e.g., Balanda, Stanton, Lowe, & Purdie, 1999; Dixon, Borland, & Hill, 1999). This ambiguity might arise because different behaviours have been examined. Stanton et al (2004), from their review of the sun protection literature, suggest that women are more likely to use sun protective measures and have higher levels of knowledge about skin cancer and skin protection than men, but they were also more likely to sunbathe and to use sunbeds.

Associations have been shown between the attitudes, knowledge and behaviour of adolescents in the arena of sun exposure and sun protection (Stanton et al., 2004). Evidence suggests adolescents have low levels of sun protection behaviours and high levels of sun exposure and sunburns (e.g., Cokkinides et al., 2006; Stanton et al., 2004). During adolescence sun exposure and sun protection knowledge increase with age, yet there is a decrease in sun protection behaviours (Broadstock et. al., 1996). In their review of the tanning literature, Arthey and Clarke (1996) concluded that while many people show a good level of knowledge about the dangers of excessive sun exposure and the need for sun protection, this knowledge did not often transfer into behaviour. Many people, particularly adolescents, still wanted and actively sought a suntan. Recent research that speaks to these

findings indicates that increases in knowledge about the risks of sun-exposure do not necessarily result in safer sun behaviour during adolescence because it is mediated by attitudes to sun bathing and tanning (Wright, Reeder, Gray, & Cox, 2008). However, the sun protection behaviour of younger children is more dependent on parents than it is for adolescents and in this arena parental knowledge has been shown to influence use of sun protection. Parents who are more knowledgeable and who use sun protection themselves are more likely to protect their children from the sun (Grob et al., 1993; O'Riordan et al., 2003).

Parents' influence on childrens' sun protective behaviour is less evident in adolescence when compared with childhood. Nonetheless there is evidence to suggest that parents remain a notable influence despite the increasing importance of the peer group (Stanton et al., 2004). Parental influence has recently been suggested as an explanation for a decreasing prevalence of sunburns found in younger adolescents (Cokkinides et al., 2006). Further research examining associations between parents', friends' and adolescents' sun exposure and sun protection behaviours suggests that parent and peer modelling of sun protection behaviours (Reynolds et al.,1996), perceived parental use of sun protection (Balanda et al., 1999; Grob et al, 1993; Fisher et al, 1996), information from family and friends about sun protection (Cokkinides, et al., 2001), perceived norms of the peer group (Wichstrom, 1994) and having friends who sunbathe (Keesling & Friedman, 1987) are all associated with adolescent sun exposure and sun protection behaviours.

A key question for the present study is whether adolescents and their friends share similar sun exposure and sun protective behaviours and, if so, how that association might be interpreted. Previous research has consistently shown that adolescent friends show similarities across a wide range of behaviours (Cohen, 1977; Eiser, et al., 1991), some of which are relevant to health (e.g., Mercken, Candel, Willems, & de Vries, 2009). These similarities have most commonly been viewed as a consequence of peer influence. However, longitudinal studies of adolescent smoking suggest that much of the similarity arises because

adolescents select friends who already have the same behaviour (e.g., Hall & Valente, 2007; Hoffman et al, 2007). Therefore, rather than changing their own behaviour to be accepted by a preferred group adolescents seem to have formed selection criteria before they enter a group. Adolescents select friends on the basis of multiple, pre-existing similarities which themselves may be a consequence of familial influence at an earlier point in time, rather than being solely a consequence of peer influence (Eiser et al., 1991).

A particularly consistent familial influence on young people is parenting style. Researchers concerned with parenting style regularly identify two primary domains of parenting commonly termed parental supportiveness (also referred to as parental responsiveness) and behavioural control (also referred to as parental demandingness), (see Baumrind 1991; Maccoby & Martin, 1983). Parental supportiveness involves being engaged in understanding and validating children's experiences and allowing young people levels of psychological and behavioural autonomy appropriate to their age. Parental behavioural control is concerned with how parents maintain or modify a child's behaviour and how open they are to give and take with their children and to the use of explanation. It involves parents making age appropriate maturity demands, establishing appropriate rules and limits, monitoring activity and using disciplinary methods that are supportive rather than punitive. Median splits on these two dimensions of parenting can be used to define four styles of parenting; parents who convey both above average levels of supportiveness and exercise above average levels of behavioural control have been found to be most effective in the socialization of their children. This approach to parenting has been termed "authoritative parenting" (e.g., Baumrind, 1991; Darling & Steinberg, 1993; Maccoby & Martin, 1983).

Authoritative parenting has been consistently associated with beneficial developmental and health behaviour outcomes compared with other styles of parenting. Authoritative parenting enhances the development of adolescents' social competencies, academic achievement and school engagement and reduces the development of risk

behaviours including alcohol, tobacco and other substance use (e.g., Baumrind, 1991; Cohen & Rice, 1997; Fletcher, 1999; Lamborn, Mounts, Steinberg, & Dornbusch, 1991; Lohaus, Vierhaus, & Ball, 2009; Simons-Morton & Chen, 2009; Vučina & Bećirević, 2007). Authoritative parenting is also associated with friendship selection processes (e.g., Fletcher, Darling, Dornbusch & Steinberg, 1995; Simons-Morton & Chen, 2009).

Why is authoritative parenting associated with such a range of positive outcomes for young people? Darling and Steinberg (1993) highlighted an important distinction between parenting style and parenting practices and through this suggested a possible mechanism through which parenting style casts its influence. These authors describe two traditions in child socialisation research, the study of global parent characteristics or parenting styles and the study of specific parenting practices. They propose that parenting style is best conceptualised as a general context or emotional climate that moderates the influence of more specific parenting practices. Parenting practices are best thought of as operating in fairly circumscribed socialisation domains such as, for example, educational attainment, tobacco use or dietary behaviour. Whereas parenting style is independent of particular socialisation domains rather it affords a global approach to parenting and to the goals of parenting. To illustrate this point if the global parenting environment is broadly supportive of educational achievement and involvement this value is communicated through domain specific practices such as attending parents' evenings and setting time aside for helping with homework. This distinction has gained some empirical support from studies showing independent effects of parenting style and domain specific parenting practices on educational involvement, dietary behaviour and smoking (Huver, Engels, Vermulst, & de Vries, 2007; Spera, 2005; Vereecken, Legiest, De Bourdeaudhuij, & Maes, 2009).

A further avenue through which parenting style might influence adolescent behaviour is that of friendship selection. To investigate this research has focused on examining associations between parental authoritativeness in the home, friends' parents'

authoritativeness and a range of adolescent behaviors including academic achievement, substance use and smoking. Fletcher et al., (1995) found that friends' parents' authoritativeness benefitted adolescents above and beyond the positive effects of their own parents' authoritativeness, but this effect was indirect and mediated through friends' own behaviors. Whereas Mewse et al., (2004) did not find an independent association between friends' parents' authoritativeness and adolescents' smoking when own parents' authoritativeness and friends' smoking behaviours were controlled. While there is some ambiguity between these studies they did both show that adolescent friends share similar parenting backgrounds and that own parents' authoritativeness was associated with beneficial outcomes for adolescents. As such findings are supportive of the argument that authoritative parenting is associated with adolescent competence and that competent young people are attracted to, and influence, each other. In this way the peer group can be inferred to amplify, or maintain, the enhanced competencies that adolescents from authoritative parenting backgrounds exhibit. Thus parents, through their parenting strategies, both directly and indirectly influence adolescent behaviour through contributing to peer group norms and consequently to the homogeneity of behaviors found among adolescent friends. For these reasons we included investigation of the parenting backgrounds of adolescent friends in the current paper, alongside examination of the role of own parent's authoritativeness.

In the light of the already known associations between authoritative parenting and adolescents' behaviours and attitudes across a broad domain of areas we were particularly concerned to examine associations between authoritative parenting and adolescent sun exposure and sun protective behaviours. However, following Collins, Maccoby, Steinberg, Hetherington and Bornstein (2000) we recognise that while families are important influences on young people their effect can only be understood in light of the simultaneous influence of other social arenas such as peer groups, the influence of which adds to, shapes and moderates the effect of the family. Therefore, this paper examines the influence of friends as well as

parents on the sun exposure and sun protective behaviours of adolescents. In particular we investigate whether adolescent friends share similar sun exposure and sun protective behaviours and, if so, whether parenting background might offer a useful theoretical framework within which this association might be interpreted. To ensure that any observed association between the sun exposure attitudes and behaviours of adolescents and their friends was not an artefact of shared source variance we not only collected data from target adolescents but we also collected data from the adolescents' named friends.

The present study focuses on adolescents' perceptions of their parents' behaviours. We were concerned to use adolescents' reports rather than parents' self-reports to ensure that we had responses from a larger and more representative sample of adolescents than would be possible if the study had been limited to include only those young people whose (well-functioning) parents also agreed to take part. This is the approach we took successfully in prior research on smoking (Mewse et al., 2004); and in unpublished research we have used both sources of information about parental style and have found that they are well correlated.

Four hypotheses derived from the literature are tested in this paper. It is hypothesised that 1) adolescents and their friends will show similarities in their sun exposure, sun protective behaviours and their perceptions of parenting style; 2) perceived authoritative parenting will be positively associated with adolescent sun protective behaviours even after the effects of other variables in the family and peer environments are controlled; 3) perceived authoritative parenting will be negatively associated with adolescent sun exposure behaviour even after the effects of other variables in the family and peer environments are controlled and 4) friends' parents' perceived authoritativeness will be positively associated with adolescents' sun protective behaviours and negatively associated with adolescents' sun exposure behaviour after the effects of the adolescents' own parents' perceived authoritativeness and other family and peer variables are controlled.

Method

Participants

Four hundred and two adolescents (198 males, 204 females), aged 13 -17 years (M = 14.47, SD = 1.29) participated in this research. The participants attended a large mixed gender school of about 1,360 pupils and were drawn from school years nine, ten and twelve. The school caters for all abilities of pupils from the ages of 11-18 and is situated in a small coastal town in South Wales, UK, strongly dependent on the tourist industry. Pupils are recruited from a wide rural area that includes some less affluent towns and where there is little population movement. Reflecting the local population characteristics, almost all participants were British Caucasian, but from a broad range of socio-economic backgrounds. Because of the coastal location of the town, the adolescents all had relatively easy access to accepted sunbathing sites such as beaches.

Procedure

All 491 pupils in School Grades Nine, Ten and Twelve were invited to take part in this research. In view of the age of the participants and their ability to provide informed consent, and in agreement with the school and our own departmental ethical committee, passive informed consent procedures were used. Pupils were given the opportunity to refuse to participate on the day of the study and an alternative activity was available. Approximately 13% of pupils were absent from school on the day the questionnaires were administered and a further nine pupils refused to participate. The majority of the students who were absent on the day of data collection were attending a school field trip, which suggests that there was no particular pattern inherent in most of these absences. Non-completion is a potential source of a confound in our research design, since parenting style is associated with many measures of behaviour and achievement in school, including truancy (e.g., Dornbusch, Ritter, Leiderman, Roberts & Fraleigh, 1987; Roche, Ahmed & Blum, 2008). However the unauthorised absence rate was too low in the present sample for such an effect to affect the interpretation

of our results. Approximately 82% of pupils on the school register for participating year groups completed questionnaires during early morning small group tutorial meetings, in silence. Participants wrote their names on the front of the questionnaires and were asked to provide the names of up to five friends who attended the same school. Forty five participants who did not name any friends or whose named friends were not identifiable were eliminated from the sample. The data from the remaining 357 participants were linked with named friends' data.

Ethical approval for this research was obtained from the School of Psychology Ethics Committee at the University of Exeter.

Questionnaire

In addition to other items not relevant to this report, the questionnaire included items designed to measure the following factors:

Skin type. Participants self-classified their skin type through selecting one of seven response options. These seven categories were then collapsed in to three skin types: (1) burns only, never tans; (2) burns first then tans (3) never burns, just tans (Johnson and Lookingbill, 1984). These skin types have been shown to relate to sun protection and attitudes towards sun-tanning (e.g., Clarke, William and Arthey, 1997).

Sun exposure behaviour. Participants provided self-reports of the number of hours spent sunbathing on a typical day in the summer, whether they usually sunbathed alone, sunbathed with parents or sunbathed with friends.

Friends' sun exposure behaviour. Friends' self-reports of the number of hours spent sunbathing on a typical day in the summer were used to measure their sun exposure behaviour. Mean scores were computed across named friends.

Items measuring adolescents', friends' and parents' use of sun protection were all measured on a five point scale with 1 indicating never, to 5 indicating always, 3 indicated often. Higher scores on these measures indicate higher use of sun protective measures.

Sun protection behaviour. Participants reported how often they used sunscreen when in the sun generally. Participants were also asked when on the beach on a sunny day how often they used sunscreen, how often they wore a hat, how often they wore a t-shirt, and whether they sought shade in the middle part of the day. Cronbach's alpha for a scale based on these five items was .66.

Friends' use of sun protection. Participants' friends' self-reports of how often they used sunscreen, wore a hat, wore a t-shirt or sought shade when on the beach on a sunny day were used to compute a measure of friends' sun protection behaviour, for which Cronbach's alpha was .56.

Parents' use of sun protection. Participants reported how often they thought their parents used sunscreen, wore a hat or a t-shirt, sought shade when on the beach on a sunny day. Cronbach's alpha = .65.

Sun Tan Attitudes. Five items were developed from the literature to measure adolescents' attitudes towards sun tans, in particular whether tans were viewed as healthy (e.g., does having a sun tan make you feel healthier?) or attractive (e.g., does having a sun tan make you feel more attractive?). Items were measured on a four point scale with 1 indicating never, to 4 indicating always. Higher scores on this measure indicate more positive attitudes towards sun tans. Cronbach's alpha = .75.

Parental disapproval of sunbathing without protection. The measure of parental disapproval was adapted from Eiser et al. (1989). Two items asked adolescents how (1) their mother/female guardian and (2) their father/male guardian would react to them sunbathing without protection. Items were measured on a five point scale with 1 indicating strong disapproval, 5 indicating strong approval and 3 indicating neither approval nor disapproval. The correlation between scores on these items was highly significant, $r\ (347) = .84$, $p < .001$. The items were combined to form a single measure of perceived parental

disapproval. Higher scores on this scale indicate greater perceived parental tolerance of sunbathing without protection.

Authoritative parenting. Twenty-six items measuring adolescents' perceptions of parental acceptance/involvement (support) and strictness/supervision (control) were adapted from Lamborn et al. (1991). The Parental Support measure comprised 16 items (e.g., I can count on my (parent/guardian) to help me out if I have some kind of problem). Items were measured on a four point scale with 1 indicating never and 4 indicating always (16 items, alpha = .83). The Parental Control measure comprised 10 items (e.g., How much do your parents try to know who your friends are?). Items were measured on a four point scale with 1 indicating never try and 4 indicating always try (10 items, alpha = .84). The intercorrelation between the measures of support and control was, $r(355) = .29$, $p < .01$. Following Fletcher et al. (1995) and Mewse et al., (2004) the measures of support and control were used to construct an ordinal measure of parental authoritativeness. Median split procedures were used to classify families on a 3-point scale. Families scoring above the sample median on both parenting measures (support and control) were assigned a score of 2 (authoritative), families scoring above the sample median on one measure only were assigned a score of 1 (somewhat authoritative) and parents scoring below the sample median on both measures were assigned a score of 0 (non-authoritative/neglectful).

Friends' parents' authoritativeness. The level of parental authoritativeness in each friendship group was calculated by averaging levels of perceived authoritativeness across friends, omitting the target adolescent. High scores on this measure indicate that friends perceive their parents to be relatively more authoritative.

Results

Descriptive Analyses and Bivariate Correlations between Variables

The means, standard deviations, ranges and Spearman's rho correlations for the measures are given in Table1.

Age was significantly associated with four of the measures; older adolescents spent more time sunbathing (rho=.17, (357), p<.01), had friends who reported spending more time sun bathing (rho=24, (355), p<.01), perceived their parents as less authoritative (rho=-34, (336), p<.01) and had friends who perceived their parents as less authoritative (rho=-57, (354), p<.01) compared with younger adolescents.

Gender was significantly associated with five of the measures; females compared with males spent more time sunbathing (rho=.26, (354), p<.01), had friends who also reported spending more time sunbathing (rho=.36, (355), p<.01), were more likely to sunbathe with friends (rho=.22, (350), p<.01), perceived their own parents (rho=.14, (336), p<.01) and their friends' parents (rho=.23, (354), p<.01) to be more authoritative in their parenting style.

Sun protection behaviour was significantly associated with six of the variables: adolescents who used more sun protection had friends who also used more sun protection, spent less time sunbathing, had less positive attitudes towards suntans, sunbathed more with their parents, perceived their parents as more authoritative and had friends who perceive their parents as more authoritative.

The amount of time that adolescents spent sunbathing was associated with six of the variables: adolescents who spent more hours sunbathing had friends who also spent more time sunbathing, used less sun protection, had friends who used less sun protection, had more positive attitudes towards sun tans, spent more time sunbathing with friends and had friends who reported lower levels of authoritative parenting.

To examine which of the sun variables were independent predictors of adolescent sun protection and sun exposure behaviours a series of multiple regression analyses were conducted. The predictor variables in these analyses were those shown to be significantly associated with the outcome variables in the earlier correlation analyses. This resulted in some differences between the variables used to predict sun protection and sun exposure.

Multiple Regression Analyses for Sun Protection Behaviour

Multiple regression analyses were used to examine which of the sun variables (attitudes towards sun tans, perceived parent and peer sun protection behaviour, sunbathing with parents, parental disapproval of sun bathing without protection) were independent predictors of adolescent sun protection behaviour. These analyses also examined whether the addition of parental authoritativeness to the regression model would significantly improve its fit.

Because some of the social variables including attitudes towards suntans and parenting style, are correlated with the demographic variables (age and gender), the data were submitted to hierarchical regression analysis, in which the social variables were added in a stepwise fashion to the model after the inclusion of demographic factors and skin type. The dependent variable predicted was use of sun protection.

Three regression models were fitted. Model 1 examined which of the sun exposure variables (attitudes towards sun tans, perceived parent and peer sun protection behaviour, sunbathing with parents) were the best independent predictors of adolescent sun protection behaviour. Model 2 examined whether parental authoritativeness had an effect over and above the demographic variables, skin type, and parents' and friends' behaviour. Model 3 examined whether friends' parents' authoritativeness had an independent effect over and above the effect of friends' own behaviour and of adolescents' own parents' authoritativeness.

Table 2 shows the results of the regression analyses. In Model 1, there were significant effects of friends' and parents' sun protection behaviours, adolescents' attitudes towards suntans, sunbathing with parents and skin type, but not of age, gender or parental disapproval of unprotected sunbathing. In Model 2, parental authoritativeness emerged as a strongly positive predictor of protected exposure, even with adolescents' attitudes and parents' and friends' behaviour taken into account. Model 3 shows that friends' parents'

authoritativeness had an independent protective effect over and above the effect of friends' own behaviour and of adolescents' own parents' authoritativeness.

Comparison of the models confirms that parental authoritativeness in adolescents' own homes is an important predictor of adolescent use of sun protection: R^2_{adj} value of .55 was significantly higher in Model 2 which included this variable (F Change (1,311) = 23.41, $p < .001$), than in Model 1 ($R^2_{adj} = .52$). Comparisons of the models also confirms that friends' parents' authoritativeness is an important predictor of adolescents' use of sun protection: the R^2_{adj} value of .56 was significantly higher in Model 3 which included this variable, than in Model 2 (F Change (1,310) = 4.67, $p < .05$).

Multiple Regression Predicting Time Spent Sunbathing

Multiple regression analyses were used to examine which of the sun exposure variables (attitudes towards sun tans, friends' sun bathing behaviour, sunbathing with friends) were independent predictors of adolescent sun exposure behaviour. These analyses also examined whether friends' parents' authoritativeness would have an independent effect over and above the effect of friends' own behaviour. Parental authoritativeness in adolescents' own homes was not included in this analysis as it was not significantly correlated with adolescent sunbathing behaviour. As with the previous regression analysis because some of the social variables are correlated with the demographic variables (age and gender), the data were submitted to hierarchical regression analysis, in which the three social variables were entered into the model after the inclusion of demographic factors (gender and age) and skin type. The dependent variable predicted was time spent sunbathing.

Two regression models were fitted. Model 1 examined which of the sun exposure variables (attitudes towards sun tans, friends' sun bathing behaviour, sunbathing with friends) were the best independent predictors of adolescent sun exposure behaviour. Model 2 examined whether friends' parents' authoritativeness had an independent effect over and above the effect of friends' own behaviour.

. Table 3 shows the results of the regression analyses. In Model 1, there were significant effects of friends' sunbathing behaviours, sunbathing with friends, adolescents' attitudes towards sun tans, skin type and gender but not age. In Model 2, friends' parents' authoritativeness did not emerge as a significant predictor of time spent sunbathing after friends' sunbathing behaviour and adolescents' attitudes were taken into account. Comparison of the models confirms that friends' parents' authoritativeness is not an important predictor of adolescents' sun bathing behaviour: the R^2_{adj} value of .24 was not significantly higher in Model 2, which included this variable (F Change (1,337) = 2.40, p > .05), than in Model 1 (R^2_{adj} = .24).

Discussion

The current study tested four hypotheses. The first hypothesis was that there would be positive associations between the sun exposure and sun protective behaviours and parenting backgrounds of adolescents and their friends. This hypothesis was supported. Adolescents' sun exposure and sun protective behaviours were significantly associated with their friends' behaviours. The correlation coefficients (.34 and .58 respectively) indicated that this was a strong relationship. The significant correlation between parental authoritativeness and friends' parents' authoritativeness indicates that adolescents and their friends also share similar parenting backgrounds. The second hypothesis that authoritative parenting will be positively associated with adolescent sun protective behaviours was also supported. Parental authoritativeness was a significant predictor of using sun protection even when other variables in the family and peer environments were controlled. The third hypothesis was not supported. Authoritative parenting was not associated with adolescent sun exposure at the univariate level therefore it was not included in the regression analysis for sun exposure. The fourth hypothesis gained partial support in that friends' parents' authoritativeness was a significant predictor of the use of sun protection by adolescents but it was not associated with sun exposure behaviour when the behaviour of friends was controlled.

The findings highlight authoritative parenting as an important predictor of adolescent sun protective behaviour. Adolescents who use more sun protection have parents who are perceived as authoritative in their parenting style and have friends who also perceived their parents as authoritative. We are not aware of any other research that has demonstrated such an effect for sun protection. However, the result is consistent with literature demonstrating the various psychological and behavioral ways in which adolescents benefit from having parents who exhibit authoritative parenting (e.g., Baumrind, 1991; Mounts, 1995; Steinberg et.al., 1994). It appears that as with other behaviours such as alcohol, tobacco and substance use (e.g., Baumrind, 1991; Cohen & Rice, 1997; Mewse et al., 2004; Vučina & Bećirević, 2007) children of authoritative parents have less hazardous behaviour.

In contrast, the amount of time that adolescents report spending sun-bathing was not significantly associated with authoritative parenting, but was associated with gender and with adolescents' attitudes towards suntans, friends' sun-bathing behaviours and sunbathing with friends. Young people who spend more time sunbathing are more likely to be female and to have more positive attitudes towards having a suntan, have friends who spend more time sunbathing and tend to sunbathe more with their friends. The significant correlation noted at the bivariate level between hours spent sunbathing and friends' parents' authoritativeness, but not own parents' authoritativeness, was counterintuitive. However, the regression analysis showed this association was no longer significant after friends' own sun exposure behaviour was taken into account. This finding accords with previous work with authoritative parenting and adolescent smoking (Mewse et al., 2004) and appears to highlight the importance of friends' influence on sun exposure behaviour rather than that of parents.

In the light of the distinction highlighted by Darling and Steinberg (1993) that parenting style forms a context or emotional climate that either reinforces or undermines the effectiveness of more specific parenting practices the current research examined perceived parental disapproval of sunbathing alongside parental authoritativeness. However, perceived

parental disapproval of unprotected sunbathing was not significantly associated with either adolescent sun exposure or sun protective behaviours when considered alongside other family and peer variables that included parental authoritativeness. This finding contradicts previous research indicating that parenting practices can be important predictors of adolescent health behaviour ((Huver et al., 2007; Mewse et al., 2004; Vereecken et al., 2009).). It is not clear why this difference between studies has arisen but it is possible that the measure of disapproval used in the current study did not adequately capture specific parental socialisation practices with regard to sun protection. However, given our finding of a strong association between authoritative parenting and adolescents' use of sun protection it is possible that in this arena specific parenting practices are indeed less important than the global parenting climate afforded by an authoritative parenting style. Future research should develop a specific measure of the practices parents use to communicate with and encourage their children to take precautions when sunbathing to enable the distinction between practices and style to be further disentangled and explored.

Taken together findings indicate that authoritative parenting is associated with the level of risk adolescents take when exposing themselves to the sun rather than with the actual amount of time spent sunbathing, which is associated more with friends' sunbathing behaviours. However, it is important to consider this interpretation in light of other findings in the current paper. Our results also showed that adolescent friends share similar sun exposure and sun protective behaviours as well as similar parenting backgrounds. These findings are in in accordance with other research showing that adolescent friends share similar behaviours across a wide range of variables some of which are relevant to health (e.g., Eiser et al., 1991; Mercken et al., 2009). However, to our knowledge these relationships have not previously been demonstrated with regard to adolescents' sun exposure and sun protection behaviours. How these friendship group similarities are interpreted is of practical and theoretical interest. They probably arise through the mutual processes of peer influence

and friendship selection. While the cross-sectional nature of the current study precludes separating the effects of friendship selection processes from those of peer influence, taken together the findings lend support to arguments suggesting that through its associations with many variables, some of which are important to friendship selection processes, parenting influences the norms of adolescent friendship groups. This suggests that one possible interpretation of the similarities found in the current research between adolescents and their friends is that parents through their parenting strategies have, over time, cultivated certain attitudes and behaviours and that these influenced their child's choice of likeminded friends. Once friendships are formed the process of reciprocal influence takes over and existing similarities in sun exposure and sun protective behaviours are consolidated and strengthened.

Two caveats need to be noted. First, the study was correlational so we are unable to investigate questions of causality. However, logical considerations suggest that factors such as parental behaviour, attitudes and parenting style are likely to be causative of rather than caused by young people's risky exposure to the sun. Certainly there is evidence from longitudinal research to suggest that parenting style plays a causal role in some health behaviours (e.g., Mounts, 2002, Mounts, 1995). Secondly, because of the geographical location of the school from which the participants were drawn, the sample was a homogeneous group, from a rural, coastal area and almost all were British Caucasians. The findings give a clear view of the trends in this particular community and since the health risks of sun exposure are more serious for the ethnically Caucasian than for other UK ethnic groups, this feature of the sample was a strength rather than a weakness of the study. Nonetheless, there is evidence to suggest that the influence of parenting varies between ethnic groups and across cultural contexts (Darling & Steinberg, 1993). It cannot be assumed that the findings reported would be replicated in samples of adolescents from other ethnic groups or cultural contexts. Clearly more research is needed with a more heterogeneous sample or with other homogenous ethnic groups to tease out these important differences.

Our findings serve to underline the importance of studying how parents and peers simultaneously influence the sun exposure and sun protective behaviors of adolescents. As such the findings have implications for involving the family in health education initiatives. To date interventions targeting adolescents but focusing on parents are sparse, though they can be effective (e.g., Reynolds et al., 2008). Unsurprisingly interventions directed at parents have mainly been proposed with younger children rather than with adolescents as the targets, but even with that age group the prevailing view is that there is insufficient evidence to target interventions at family processes (e.g., Saraiya et al., 2004). Our finding that authoritative parenting is associated with sun protective behaviour during adolescence provides some further evidence of the importance of parents in the use of sun protection in adolescents. These findings suggest a need for continuing research into how parents can best encourage their children to practice safer sun behaviour. Furthermore, while our data highlight the important role played by family socialization processes in relation to the sun exposure risks that young people take, friends were also shown to be important independent influences with regard to actual sun exposure. We interpreted this association as also partly arising from the wide ranging influence parenting style has, so that it influences the selection of friends and hence the peer pressures that adolescents come under, as well as affecting behaviour directly. This suggests that if public health initiatives are to be more effective it is critically important to involve parents as well as peers in promoting and nurturing the use of safe sun practices during adolescence.

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References

Arthey, S., & Clarke, V. A. (1995). Suntanning and sun protection – a review of the psychological literature. Social Science & Medicine, 40, (2), 265-274.

Balanda, K.P., Stanton, W. R., Lowe, J. B., & Purdie, J. (1999). Predictors of sun protective behaviors among school students. Behavioral Medicine, 25, 28-35.

Baumrind, D. (1991). The influence of parenting style on adolescent competence and substance use. Journal of Early Adolescence, 11, 56-95.

Broadstock, M., Borland, R., & Hill, D. (1996). Knowledge, attitudes and reported behaviours relevant to sun protection and suntanning in adolescents. Psychology & Health, 11,527-539

Brook., J. S., Brook, D. W., De La Rosa, M., Whiteman, M., Johnson, E., & Montoya, I. (2001). Adolescent Illegal Drug Use: The Impact of Personality, Family, and Environmental Factors. Journal of Behavioral Medicine, 24, 183-203.

Brook, J, S., Ning, Y., & Brook, D. W. (2006). Personality risk factors associated with trajectories of tobacco use. The American Journal on Addictions, 15, (6), 426-433.

Buller, D, B., & Borland, R. (1999). Skin cancer prevention for children: A critical review. Health Education and Behavior, 26, 317-343.

Callas P. W., Flynn B. S., Worden J. K. (2004). Potentially modifiable psychosocial factors associated with alcohol use during early adolescence. Addictive behaviors, 29, 1503-1515.

Cancer Research UK. (2009). Key Facts on Skin Cancer. Retrieved June 10th 2009, from Cancer Research UK Web Site: http://info.cancerresearchuk.org/cancerstats/types/skin/

Clarke, V., T., Williams, & Arthey, S. (1997). Skin type and optimistic bias in relation to the sun protection and sun tanning behaviors of young adults. Journal of Behavioral Medicine, 20, 207-222.

Cokkinides, V. E., Johnston-Davis, K., Weinstock, M., O'Connell, M, C., Kalsbeek, W., Thun, M, J., & Wingo, P. A. (2001). Sun exposure and sun protection behaviors and attitudes among U.S. youth, 11 to 18 years of age. Preventive Medicine: An International Journal Devoted to Practice and Theory, 33, 141-152.

Cokkinides, V., Weinstock, M., Glanz, K., Albano, J., Ward, E., & Thun, M. (2006). Trends in sunburns, sun protection practices, and attitudes toward sun exposure protection and tanning among US adolescents, 1998-2004. Pediatrics, 118, (3), 853-864.

Collins**,** W. A., Maccoby**,** E. E., Steinberg**,** L., Hetherington**,** E. M., Bornstein, M. H. (2000). Contemporary research on parenting: the case for nature and nurture. American Psychologist, 55, 218-232.

Darling, N., & Steinberg, L. (1993). Parenting style as context: an integrative model. Psychological Bulletin, 113, 487-496.

Dixon, H., Borland, R., & Hill, D. (1999). Sun protection and sunburn in primary school children: The influence of age, gender, and coloring. Preventive Medicine: An International Journal Devoted to Practice and Theory, 28, 119-130.

Dornbusch, S. M., Ritter, P. L., Leiderman, P. H., Roberts, D. F., & Fraleigh, M. J. (1987). The relation of parenting style to adolescent school performance. Child Development, 58, 1244-1257.

Eiser, J. R., Morgan, M. J., Gammage, P., Brooks, N., & Kirby, N. (1991). Adolescent health behaviour and similarity attraction: Friends share smoking habits (really), but much else besides. Journal of Social Psychology, 30, 339-348.

Elwood, J. M., & Jopson, J. (1997). Melanoma and sun exposure: An overview of published studies. International Journal of Cancer, 73, 198–203.

Eshel, N., Daelmans, B., de Mello, M. C., & Martines, J. (2006). Responsive parenting: interventions and outcomes. Bulletin of the World Health Organization, 84, (12), 991-998.

Fletcher, A. C., Darling, N. E., Dornbusch, S. M., & Steinberg, L. (1995). The company they keep: Relation of adolescents' adjustment and behavior to their friends' perceptions of authoritative parenting in the social network. Developmental Psychology, 31, 300-310.

Grob, J. J., Guglielmina, C., Gouvernet, J., Zarour, H., Noe, C. and Bonerandi, J. J. (1993). Study of sunbathing habits in children and adolescents: application to prevention of melanoma. Dermatology, 186, 94–98.

Hall, J. A., & Valente, T. W. (2007). Adolescent smoking networks: The effects of influence and selection on future smoking. Addictive Behaviors, 32, 3054-3059.

Heckman, C. J., Egleston, B. L., Wilson, D. B., & Ingersoll, K. S. (2008). A preliminary investigation of the predictors of tanning dependence, American Journal of Health Behaviour, 32, 451-464

Hoffman, B. R., Monge, P. R., Chou, C., & Valente, T. W. (2007). Perceived peer influence and peer selection on adolescent smoking. Addictive Behaviors, 32, 1546-1554.

Horsley, L., Charlton, A., & Waterman, C. (2002). Current action for skin cancer risk reduction in English schools: pupils' behaviour in relation to sunburn. Health Education, 17, 715-731.

Huver, R. M. E., Engels, R C., Vermulst, A. A., & de Vries, H. (2007). Is parenting style a context for smoking-specific parenting practices? Drug and Alcohol Dependence, 89, (2-3), 116-125.

Jackson, C., & Henricksen, L (1998). Do as I say: parent smoking, anti smoking socialization and smoking onset among children. Addictive Behaviors, 22, 107-114.

Johnson, E., & Lookingbill, D. P. (1984). Sunscreen use and sun exposure. Archives Dermatology, 120, 727-338

Keesling, B. & Friedman, H.S. (1987). Psychosocial factors in sunbathing and sunscreen use. Health Psychology, 6, 477-493.

Keeney, S., McKenna, H., Fleming, P., & McIlfatrick, S. (2009). Attitudes, knowledge and behaviours with regard to skin cancer: A literature review. European Journal of Oncology Nursing, 13, 29-35.

Lamborn, S. D., Mounts, N. S., Steinberg, L., & Dornbusch, S. M. (1991). Patterns of competence and adjustment among adolescents from authoritative, authoritarian, indulgent, and neglectful families. Child Development 62, 1049-1065.

Lohaus, A., Vierhaus, M., & Ball, J. (2009). Parenting styles and health-related behavior in childhood and early adolescence: Results of a longitudinal study. The Journal of Early Adolescence, 29, (4), 449-475.

Lowe, J. R., Balanda, K. P., Stanton, W. R., & Gillespie, A. M. (1999). Evaluation of a three-year school-based intervention to increase adolescent sun protection, Health Education and Behavior, 26, 396-408.

Maccoby, E., & Martin, J. (1983). Socialization in the context of the family: Parent-child interaction. In P.H. Mussen (Series Ed.) & E. M. Hetherington (Vol Ed.), Handbook of child psychology: Vol. 4. Socialization, personality, and social development (4th edition, pp. 1-101). New York: Wiley.

Mercken, L., Candel, M., Willems, P., & de Vries, H. (2009). Social influence and selection effects in the context of smoking behavior: changes during early and mid adolescence. Health Psychology, 28, (1), 73-82.

Mewse, A. J., Eiser, J. R., Slater, A. M., & Lea, S. E. G. (2004). The smoking behaviors of adolescent friends: Do parents matter? Parenting: Science and Practice, 4, 51-72.

Mounts, N. S. (1995). An ecological analysis of peer influence on adolescent grade-point average and drug-use. Developmental Psychology, 31, 915-922.

Mounts, N. S. (2002). Parental Management of Adolescent Peer Relationships in Context: The Role of Parenting Style. Journal of Family Psychology, 16(1), 58-69.

O'Riordan, D. L., Geller, A. C., Brooks, D. R., Zhang, Z., & Miller, D. R. (2003). Sunburn reduction through parental role modeling and sunscreen vigilance. Journal of Pediatrics, 142, 67-72.

Reynolds, K. D., Blaum, J. M., Jester, P. M., Weiss, H., Soong, S. J., & Diclemente, R. J. (1996). Predictors of sun exposure in adolescents in a southeastern U.S. population. Journal of Adolescent Health, 19, 409-415.

Reynolds, K. D., Buller, D. B., Yaroch, A. L., Maloy, J., Geno, C. R., & Cutter, G. R. (2008). Effects of program exposure and engagement with tailored prevention communication on sun protection by young adolescents. Journal of Health Communication, 13, 619-636.

Roche, K. M., Ahmed, S., & Blum, R. W. (2008). Enduring consequences of parenting for risk behaviors from adolescence into early adulthood. Social Science & Medicine, 66, 2023-2034.

Saraiya, M., Glanz, K., Briss, P. A., Nichols, P., White, C., Das, D., Smith, S. J., Tannor, B., Hutchinson, A. B., Wilson, K. M., Gandhi, N., Lee, N. C., Rimer, B., Coates, R. C., Kerner, J. F., Hiatt, R. A., Buffler, P., & Rochester, P. (2004). Interventions to prevent skin cancer by reducing exposure to ultraviolet radiation: A systematic review. American Journal of Preventive Medicine, 27, 422-466.

Simons-Morton, B., & Chen, R. (2009). Peer and parent influences on school engagement among early adolescents. Youth & Society, 41, (1), 3-25.

Spera, C. (2005). A Review of the Relationship Among Parenting Practices, Parenting Styles, and Adolescent School Achievement. Educational Psychology Review, 17, (2), 125-146.

Stanton, W.R., Janda, M., Baade, P.D., & Anderson, P. (2004). Primary prevention of skin cancer: a review of sun protection in Australia and internationally. Health Promotion International 19 (3), 369–378.

Vereecken, C., Legiest, E., De Bourdeaudhuij, I., & Maes, Lea. (2009). Associations between general parenting styles and specific food-related parenting practices and children's food consumption. American Journal of Health Promotion, 23, (4), 233-240.

Vučina, T., & Bećirević, I, Z. (2007). Risk factors and protective factors for adolescent substance use. Review of Psychology, 14, (1), 59-72.

Wilkinson, D. & Abraham, C. (2004). Constructing an integrated model of the antecedents of adolescent smoking. British Journal of Health Psychology, 9, 315-333.

Wright, C., Reeder, A., Gray, A., & Cox, B. (2008). Child sun protection: sun-related attitudes mediate the association between children’s knowledge and behaviours. Journal of Pediatrics and Child Health, 44, 692-698

Table 1

Spearman's Rho Correlation Coefficients and Descriptive Statistics for Hours Sunbathing, Sun Protection, Attitudes to Suntans, Parents' and Friends' Sun Protection, Sunbathe with Parents/Friends, Friends' hours sunbathing, Authoritative parenting, Friends' parents' authoritativeness and Parental disapproval.

Variables	1	2	3	4	5	6	7	8	9	10	11
1. Hours spent sunbathing	-	-.24**	.38**	-.06	.08	.34**	-.11*	.24**	-.06	-.14**	-.02
2. Sun protection		-	-.23**	.56**	.17**	-.14**	.58**	-.05	.35**	.19**	-.27**
3. Attitudes to suntans			-	-.11*	.05	.19**	-.08	.15**	-.07	-.08	-.01
4.Parents' sun protection				-	.03	.05	.33**	.01	.16**	.05	-33**
5. Sunbathe with parents					-	-.02	.11*	-.06	.21**	.02	-14*
6. Friends' hours of sunbathing						-	-.18**	.28**	-.14**	-.19**	-.05
7. Friends' sun protection							-	.01	.29**	.23**	-20**
8. Sunbathe with friends								-	.00	-.03	-14**
9. Authoritative parenting									-	.35**	-18**
10. Authoritative parenting (friends' parents)										-	-.06
11. Parents' disapproval sun											-
M	2.19	2.73	2.54	3.23	2.19	2.25	2.48	2.80	1.97	1.94	1.92
SD	1.11	0.84	0.59	0.91	0.96	0.72	0.71	0.85	0.79	0.52	0.86
Range	1-5	1-5	1-4	1-5	1-4	1-5	1-5	1-4	1-3	1-3	1-5
N	354	356	357	354	351	355	349	350	336	354	352

*p<05, **p<.01

Table 2

Hierarchical regression analysis predicting adolescents' use of sun protection (N=321)

Step	Independent Variables	B	SE B	β	R^2_{adj}
1	Year group	-0.02	0.04	-.02	
	Gender	-0.10	0.07	-.06	
	Skin	0.10	0.03	.13**	
	Friends' sun protection	0.48	0.05	.41**	
	Parents' sun protection	0.36	0.04	.40**	
	Attitudes to sunbathing	-0.19	0.06	-.13**	
	Sunbathe with parents	0.09	0.03	.10*	.52**
2	Year group	0.05	0.04	.05	
	Gender	-0.15	0.06	-.09*	
	Skin	0.11	0.03	.14**	
	Friends' sun protection	0.43	0.05	.37**	
	Parents' sun protection	0.34	0.04	.37**	
	Attitudes to sunbathing	-0.18	0.06	-.13**	
	Sunbathe with parents	0.06	0.03	.07	
	Authoritative parenting	0.22	0.05	.21**	.55**
3	Year group	0.11	0.05	.10*	
	Gender	-0.19	0.07	-.11**	
	Skin	0.11	0.03	.15**	
	Friends' sun protection	0.41	0.05	.35**	
	Parents' sun protection	0.34	0.04	.38**	
	Attitudes to sunbathing	-0.17	0.06	-.12**	
	Sunbathe with parents	0.07	0.03	.08*	
	Authoritative parenting	0.21	0.05	.20**	
	Friends' parents' authoritativeness	0.17	0.08	.11*	.56*

*p < .05, **p < .01

Table 3

Hierarchical regression analysis predicting the hours adolescents spent sunbathing (N=321)

Step	Independent Variables	B	SE B	β	R^2_{adj}
1	Year group	0.12	0.07	.09	
	Gender	0.24	0.11	.11*	
	Skin	-0.10	0.05	-.09	
	Friends' hours sunbathing	0.34	0.08	.22**	.24
	Attitudes to sunbathing	0.50	0.09	.26**	
	Sunbathe with friends	0.14	0.07	.11*	
2	Year group	0.05	0.08	.04	
	Gender	0.30	0.12	.13*	
	Skin	-0.10	0.05	-.10*	
	Friends' hours sunbathing	0.33	0.08	.21**	
	Attitudes to sunbathing	0.49	0.09	.26**	
	Sunbathe with friends	0.14	0.06	.10*	
	Friends' parental authoritativeness	0.20	0.13	-.10	.24

*p < .05, **p < .01